INVESTIGATOR'S ANNUAL REPORT

United States Department of the Interior

National Park Service

All or some of the information you provide may become available to the public.

OMB # (1024-0236)
Exp. Date (11/30/2010)
Form No. (10-226)

Reporting Year:	**Park:**	**Select the type of permit this report addresses:**
2008	Shenandoah NP	Scientific Study

Name of principal investigator or responsible official:	**Office Phone:**
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Additional investigators or key field assistants (first name, last name, office phone, office email)

Name: Temple R. Lee **Phone:** **Email:** trl2y@virginia.edu

Project Title (maximum 300 characters):

Monitoring atmospheric carbon dioxide and aerosol layer heights in the Shenandoah National Park

Park-assigned Study or Activity #:	**Park-assigned Permit #:**	**Permit Start Date:**	**Permit Expiration Date:**
SHEN-00346	SHEN-2008-SCI-0001	Jan 22, 2008	Dec 31, 2012

Scientific Study Starting Date:	**Estimated Scientific Study Ending Date:**
Feb 01, 2008	Dec 31, 2012

For either a Scientific Study or a Science Education Activity, the status is:	**For a Scientific Study that is completed, please check each of the following that applies:**
Continuing	__ A final report has been provided to the park or will be provided to the park within the next two years __ Copies of field notes, data files, photos, or other study records, as agreed, have been provided to the park __ All collected and retained specimens have been cataloged into the NPS catalog system and NPS has processed loan agreements as needed

Activity Type:

Research

Subject/Discipline:

Air Quality

Purpose of Scientific Study or Science Education Activity during the reporting year (maximum 4000 characters):

A meteorological and CO2 monitoring site has been set up at Pinnacles in the Shenandoah National Park to improve the understanding of the effects of the Blue Ridge Mountains on the weather and climate in the area and to improve the estimation of temporal and spatial distribution of carbon sources and sinks in the Eastern US. High-elevation sites such as the one established in the Shenandoah National Park are important monitoring sites since they are considered to represent the atmosphere unaffected by local sources. Continuous measurements of CO2 at these sites can provide detailed information for the study of CO2 sources and sinks on a regional scale. Before the data can be used to this end, a detailed understanding of the diurnal variability of CO2 needs to be obtained. Local transport processes induced by the mountains and the growth of the atmospheric boundary layer can have important effects on that

diurnal variability. An important goal of the current study is to monitor the diurnal variability of atmospheric CO2 concentrations in the Shenandoah national Park and to understand the effects of atmospheric processes in complex terrain on this variability. A detailed understanding of the factors affecting diurnal variability of CO2 will enable the filtering of observed CO2 data, so that the local effects can be removed from the data set.

Findings and status of Scientific Study or accomplishments of Science Education Activity during the reporting year (maximum 4000 characters):

A 17-meter tall tower was instrumented with meteorological sensors in Spring 2008. Meteorological data collection started in Summer 2008. CO and CO2 data collection started in Fall 2008. Aerosol layer heights are occasionally being monitored using an aerosol LIDAR.

For Scientific Studies (not Science Education Activities), were any specimens collected and removed from the park but not destroyed during analysis?

No

Funding specifically used in this park this reporting year that was provided by NPS (enter dollar amount):	**Funding specifically used in this park this reporting year that was provided by all other sources (enter dollar amount):**
$0	$0

List any other U.S. Government Agencies supporting this study or activity and the funding each provided this reporting year: